Videobrite™ LIQUID XTAL DISPLAY

LIQUID CRYSTAL DRIVER TECHNIQUE

Liquid crystal displays (L.C.D.'s) are driven using a symmetrical square wave with less than 50 mV D.C. offset. The low offset A.C. drive is obtained in all L.C.D. drivers by the use of "exclusive OR" (EX. OR) outputs. See fig. 1.
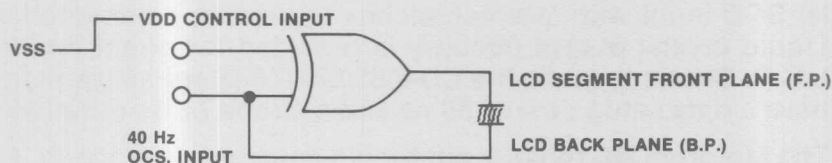

FIGURE 1

This configuration will result in a low D.C. offset A.C. drive with 2X VDD peak value, or a R.M.S. value of VDD for the L.C.D.
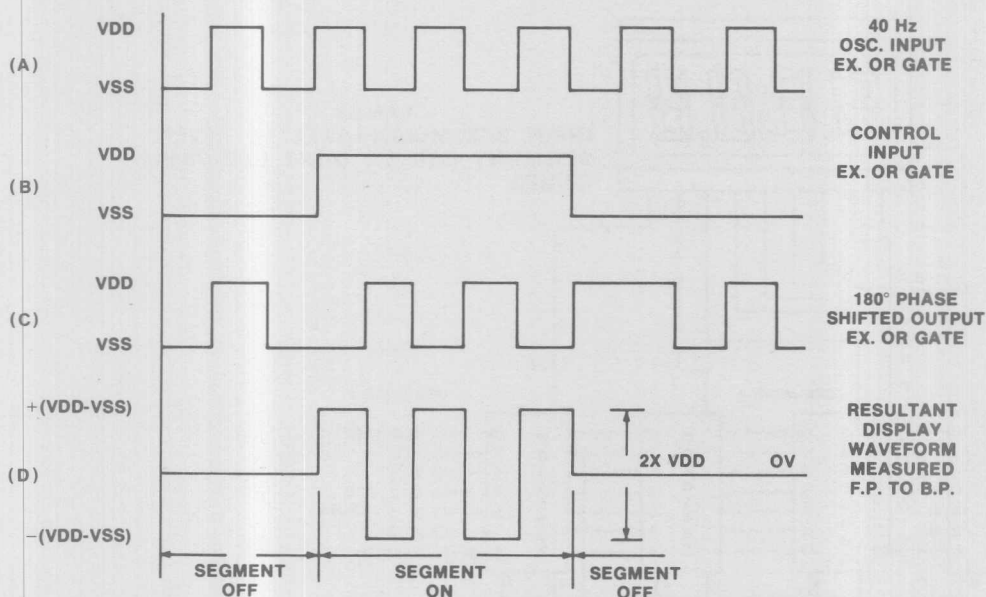

FIGURE 2

Figure 2 shows output waveforms of "exclusive OR" drives. Plot (A) is the 40 Hz 50% duty cycle square wave input to the "exclusive OR" gate. Plot (B) is the control waveform in which selects the mode of the display.

Plot (C) is the output of the "exclusive OR" gate in which has shifted the osc. input 180° when the control input is high. Plot (D) is the resultant waveform of plot (A) and (C) as seen by the L.C.D. This waveform is measured with respect to the backplane of the display.
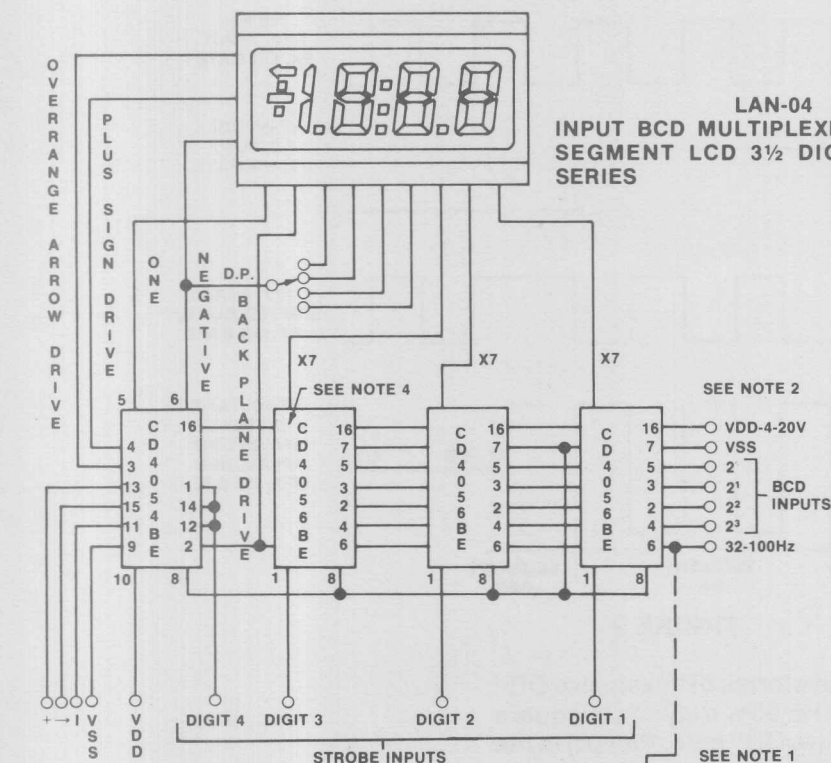
Liquid Xtal Displays inc.

Videobrite LIQUID XTAL DISPLAY

APPLICATION NOTE-04
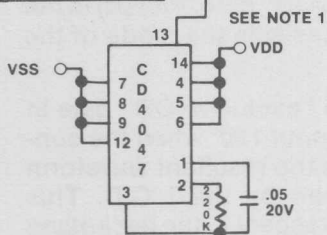### INPUT BCD MULTIPLEXED TO SEVEN SEGMENT LCD 3½ DIGIT LXD 7500 SERIES

LXD application note LAN-04 illustrates L.C.D. driving techniques for decoding multiplexed BCD information to a 3½ digit 7 segment format. Three RCA CD4056 or Motorola MC14543, one CD4054, and an optional CD4047 are employed. The CD4056/MC14543 provides parallel BCD input with internal latches to provide a demultiplex scheme. Liquid crystal output circuitry is provided for direct interface to the L.C.D. Strobe lines on the CD4055/MC14543 are active high and must have a data setup time of 30 ns and a strobe pulse duration of 40 ns.

The Motorola MC14543 is pin for pin compatable to the RCA CD4056 if pin 7 on both chips is tied to VSS. Pin 7 on the MC14543 may be used for blanking the display. Overrange, one, decimal points, negative and plus signs, are controlled by the CD4054, which provides 4 storage latches and required A.C. output. The CD4047 must be included if a 32-100Hz symmetrical square wave is not obtainable from another source.

LAN-04
INPUT BCD MULTIPLEXED TO SEVEN SEGMENT LCD 3½ DIGIT LXD 7500 SERIES

NOTES:
1. SUGGESTED 40Hz OSC. AC DRIVE SIGNAL MUST NOT EXCEED 50MV. D.C. OFFSET

2. DRIVE VOLTAGE DEPENDENT ON LOGIC LEVEL USED. LIQUID CRYSTAL TYPE MUST BE SPECIFIED FOR VOLTAGE RANGE USED, i.e. 5-9 VOLTS W2, 9-15 VOLTS, Y1

3. ALL UNUSED DIGITS OR DISCRIPTORS ON DISPLAY SHOULD BE TIED TO LCD BACK PLANE

4. MOTOROLA MC14543 L.C.D. DRIVER CHIP MAY BE SUBSTITUTED FOR RCA CD4056. PIN 7 ON MC14543 MAY BE USED FOR DISPLAY BLANKING.

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